

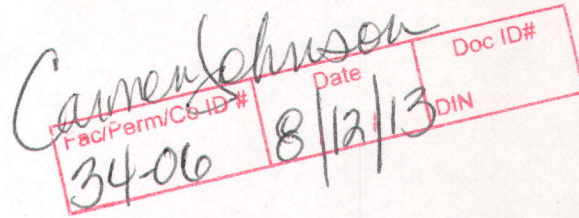
Piedmont Landfill
and Recycling Center
9900 Freeman Road
Kernersville, North Carolina 27284
919/595-6677
FAX: 919/595-9735



A Waste Management Company

JAN 06 1994

January 4, 1994



Ms. Janis McHargue
North Carolina Dept of Environment, Health, and Natural Resources
Western Area Engineer, Solid Waste Section
8025 North Point Blvd Suite 100
Winston-Salem, NC 27106-3203

Re: Leachate Recirculation Project As-Built; Piedmont Landfill & Recycling Center
(PLFRC), Kernersville, NC; Permit 34-06

Dear Ms. McHargue:

In accordance with your approval letter dated September 24, 1992 concerning the above referenced project, the PLFRC hereby submits the as built/final report of construction documentation for this project. As you can see, construction occurred in accordance with the intended design concept and intent called for in the Project Documents.

As you know, we stopped recirculating leachate on October 8, 1993 because of the new North Carolina "Subtitle D" regulations. It was the PLFRC's desire to continue this recirculation but was prevented by the strict interpretation of these regulations. Nevertheless, we will submit to you a final report on this project documenting, as best as possible, the results of this 12 month project.

As always, should you have any questions or need further information please do not hesitate to call me at (919) 595-6677.

Sincerely,

William R. Lewis, P.E.
Division President & General Manager

cc: Ed Gibson

Carmen Johnson

Fac/Perm/Co ID	Date	Doc ID#
34-06	8/12/13	DIN

FINAL REPORT
CONSTRUCTION DOCUMENTATION
FOR LEACHATE RECIRCULATION PROJECT
WMI PIEDMONT LANDFILL AND RECYCLING CENTER
FORSYTH COUNTY
KERNERSVILLE, NORTH CAROLINA
SOLID WASTE PERMIT #34-06

PREPARED FOR
WASTE MANAGEMENT OF THE CAROLINAS, INC.

DECEMBER, 1993

SEC Donohue Inc.
11240 Waples Mill Rd. Suite 100
Fairfax, VA 22030
(703) 385-3566

Project No.: 19456.100

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- A AS-BUILT RECORD DRAWINGS
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1.0 INTRODUCTION

This report documents the construction and installation of leachate recirculation dripper lines, feed line, return line, system controls, and project monitoring devices for the leachate recirculation project at the Waste Management of Carolina's, Inc., Piedmont Landfill and Recycling Center (PLRC), Kernersville, North Carolina.

2.0 PROJECT DOCUMENTS

- * Proposal for Landfill Leachate Recirculation, prepared by SEC Donohue, Inc., Greenville, South Carolina, August, 1992.
- * The letter from Mr. Edward Gibson, Piedmont Landfill and Recycling Center, to Ms. Janis McHargue, North Carolina Department of Environment, Health and Natural Resources, dated August 14, 1992.
- * The letter from Ms. Janis McHargue, North Carolina Department of Environment, Health and Natural Resources, to Mr. Edward Gibson, Piedmont Landfill and Recycling Center, dated September 24, 1992.
- * Minutes of preconstruction meeting for Leachate Recirculation project, held at WMI Piedmont Landfill and Recycling Center on October 15, 1992.
- * SEC Donohue daily reports.

3.0 PERSONNEL

The key personnel involved in the construction of the leachate recirculation project are listed below.

Piedmont Landfill and Recycling Center

Bill Lewis, General Manager and Division President
Edward Gibson, Environmental Engineer

SEC Donohue, Inc. - Design Group

Richard DeLap, P.E., Design Engineer
Susan Harrison, Design Engineer

North Carolina Cooperative Extension Service (NCSU)

Robert Rubin, PhD

SEC Donohue, Inc. - Construction Quality Assurance

John Orsillo, P.E., Certifying Engineer
P.J. Monaco, Project Manager
Chris Hardy, E.I.T., Resident Engineer
Jean Wagner, Technician

Waste Water Systems Inc. - Contractor

Tom Sinclair, Manager and Supervisor

4.0 SCOPE OF SERVICES

The scope of services for this project consisted of:

Documentation of the construction of the Leachate Recirculation Project including, trench excavation, installation of 5000 linear feet of dripper line, installation of leachate pumping apparatus and controls, and installation of feed and backflush lines from the sump location to the recirculation pad.

5.0 CONSTRUCTION ACTIVITIES

Waste Water Systems Inc. (WWSI), of Lilburn, Georgia, installed the leachate recirculation system. Construction started on October 22, 1992, and was completed February 15, 1993.

5.1 Recirculation Field

WWSI excavated the recirculation system as two pads (each approximately 85 ft. long by 60 ft wide). Each pad consists of thirty, 82.5 ft long, 3" wide trenches on 2 ft centers. The trench depth depended on the location of the garbage level and varied from 6" to 12" (typical depth of 10"). Encountered garbage was bagged and transported to the active landfill face for on site disposal.

After excavation, any exposed garbage at the bottom of the trench was covered with approximately 1 inch of soil. The dripper lines were placed in the trench bottom. The total effective area of leachate recirculation is 5000 sq ft per pad (calculated as a square foot loading basis; not as trench bottom area). Trench excavations were backfilled with the excavated soil material and with creek sand from on site stockpile.

The recirculation field was constructed in substantial accordance with the project documents.

5.2 Leachate Supply System

A pump installed by WWSI supplies leachate to the recirculation system. WWSI installed their pump adjacent to WMI PLRC's pump in the Phase I riser. The PLRC pump on/off float switches were adjusted to allow leachate storage in the sump; however, the high water signal was not adjusted. This signal was maintained at its previous location (one foot above the liner). WWSI's pump is controlled by an enclosure box located near the drip fields.

A feed line was installed to connect the enclosure box to the leachate supply. Feedlines were also installed to connect the enclosure box to each drip field. Backflush lines were installed to connect the drip field to the enclosure box, to connect the enclosure box to the storage tank, and to connect the storage tank to the sump riser. The backflush and feed lines are constructed of 2" PVC with pressure couplings.

A backflush storage tank was installed near the sump riser on the backflush line. Leachate samples can be drawn from this location. A decant line connects the storage tank to the sump riser.

The leachate supply system was installed in substantial accordance with the project documents.

5.3 System Controls

An insulated, enclosure box was installed adjacent to the drip fields. This box houses the micro-processor control for the recirculation system. At this location, the leachate flow is filtered, regulated, and distributed to each respective drip field; then, returned through the box to the storage tank. Drip field I (see record drawings) receives 0.2 gal/day/sq ft and Drip field II receives 0.1 gal/day/sq ft. Flow is directed to only one field at a time.

By using a micro-processor control and modem hook-up, WWSI can troubleshoot, operate, and/or change system parameters remotely.

After initial test runs, WWSI determined that insufficient leachate was generated by the supplying sump. WWSI, with approval from PLRC, installed a check valve on the PLRC riser discharge. In the event the Phase I sump is empty and leachate is needed for recirculation, the valve allows leachate to enter the Phase I sump from the force main. In the event WMI PLRC's pump starts to discharge leachate from the sump, the valve is re-positioned to allow discharge flow from the sump to the site force main (see record drawings). The high water signal and pump on switch of WMI PLRC's system have priority over all other factors of this system. This valve is controlled by the micro-processor at the enclosure box.

The installation of the system controls was completed in substantial accordance with the project documents.

6.0 MONITORING DEVICES

The monitoring devices of the leachate recirculation project were installed by Dr. Robert Rubin, PhD, North Carolina State University - Cooperative Extension Service.

Initial testing and gathering of background data was conducted by Dr. Rubin. The monitoring devices were installed throughout the construction process.

Lysimeter and piezometer measuring locations were installed for each drip field. These locations are illustrated in the record drawings. The piezometer monitoring locations consist of a 2" PVC, capped pipe set to a depth of approximately 6 ft. Readings are to be taken periodically by Dr. Rubin using a portable piezometric device. Lysimeter readings will also be taken at that time.

Monitoring gas wells were not installed under the inspection services covered by this report. Gas monitoring wells were covered under subsequent inspection services, see attached letter dated October 20, 1993. All other monitoring devices covered under this certification report were installed in substantial accordance with the project documents.

7.0 SUMMARY

SEC Donohue provided quality assurance personnel during construction activities associated with the Leachate Recirculation project. This report provides documentation to the observation and monitoring of the excavation and installation of the Leachate Recirculation system as a record which documents compliance to the Project Documents.

8.0 CERTIFICATION

The undersigned hereby certify that based on our professional judgement and the information obtained through on-site observation of the excavation, installation, and test operations, the Leachate Recirculation Project has been installed in accordance with the design concept and intent called for by the Project Documents as prepared and reviewed by Rust E & I design staff.

Richard Delap

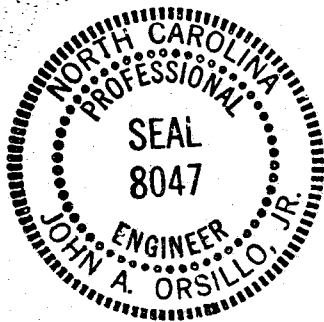
Richard Delap, P.E.
Design Engineer

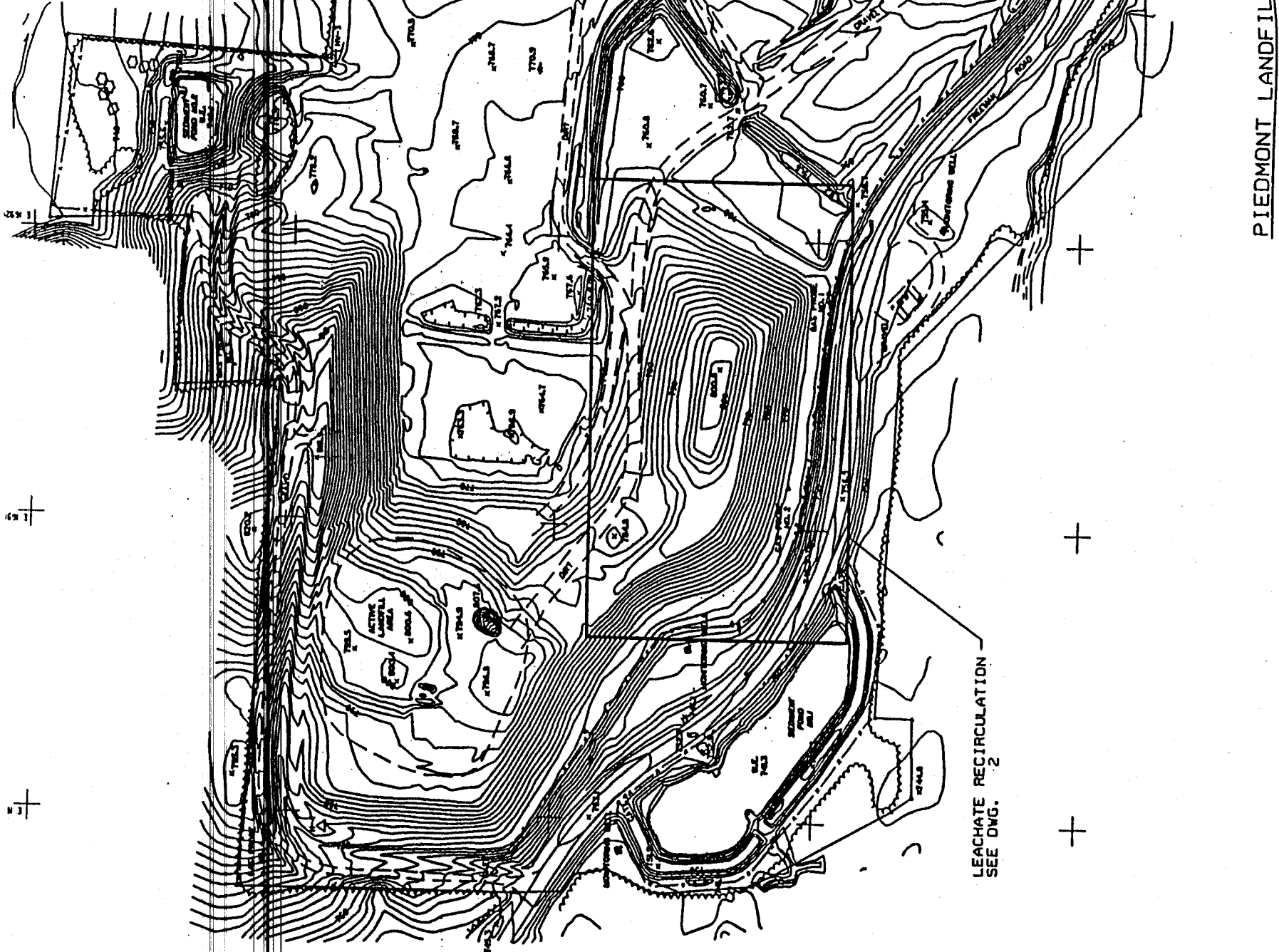
Chris E. Hardy

Chris E. Hardy, E.I.T.
Resident Engineer

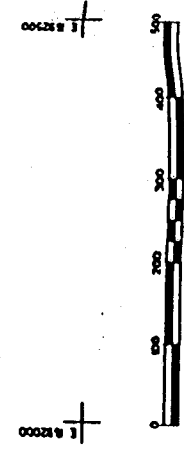
John Orsillo

John Orsillo, P.E.
Certifying Engineer





PIEDMONT LANDFILL



LEACHATE RECIRCULATION
SEE DWG. 2

THIS MAP WAS PREPARED BY THE AIR FORCE ENGINEERING AND DEVELOPMENT CENTER, WRIGHT-PATTERSON AIR FORCE BASE, OHIO, FOR THE AIR FORCE ENGINEERING AND DEVELOPMENT CENTER, WRIGHT-PATTERSON AIR FORCE BASE, OHIO, FOR THE AIR FORCE ENGINEERING AND DEVELOPMENT CENTER, WRIGHT-PATTERSON AIR FORCE BASE, OHIO.

CONTROL LEGEND

POINT	DESCRIPTION	DATE	ELEV.
1	TOP OF HILL	1964.06	764.56
2	TOP OF HILL	1964.06	764.56
3	TOP OF HILL	1964.06	764.56
4	TOP OF HILL	1964.06	764.56
5	TOP OF HILL	1964.06	764.56
6	TOP OF HILL	1964.06	764.56
7	TOP OF HILL	1964.06	764.56
8	TOP OF HILL	1964.06	764.56
9	TOP OF HILL	1964.06	764.56
10	TOP OF HILL	1964.06	764.56

LEGEND

SYMBOL	DESCRIPTION
1	BOUNDARY
2	BOUNDARY
3	BOUNDARY
4	BOUNDARY
5	BOUNDARY
6	BOUNDARY
7	BOUNDARY
8	BOUNDARY
9	BOUNDARY
10	BOUNDARY

ABBREVIATIONS

SYMBOL	DESCRIPTION
1	BOUNDARY
2	BOUNDARY
3	BOUNDARY
4	BOUNDARY
5	BOUNDARY
6	BOUNDARY
7	BOUNDARY
8	BOUNDARY
9	BOUNDARY
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SYMBOL	DESCRIPTION
1	BOUNDARY
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4	BOUNDARY
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8	BOUNDARY
9	BOUNDARY
10	BOUNDARY

1

LEACHATE RECIRCULATION
PIEDMONT LANDFILL
AND
RECYCLING CENTER

CLIENT WMI PIEDMONT

SUBJECT SUMP CROSS SECTION

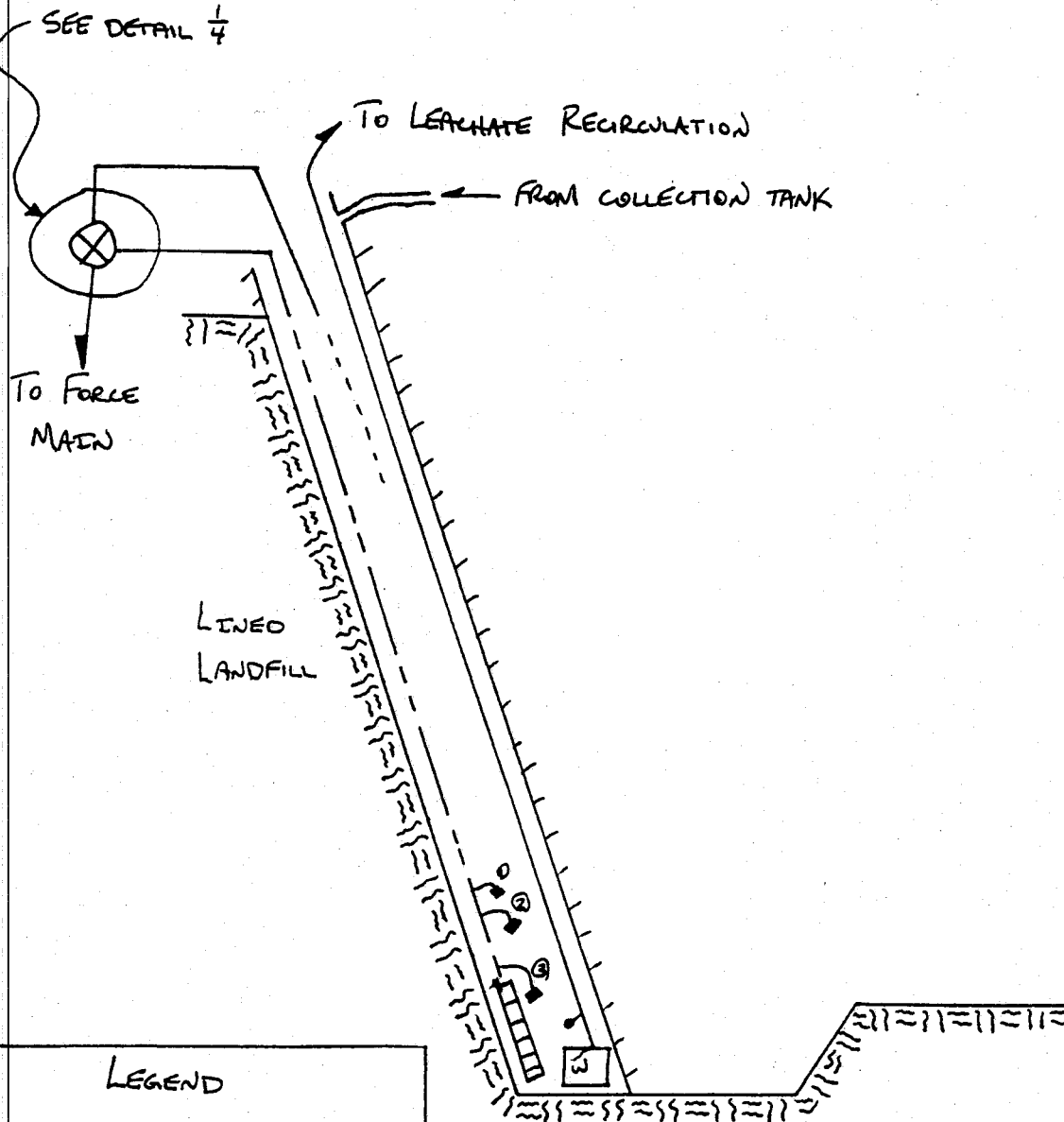
Prepared By C.E.H. Date 2-4-93

PROJECT LEACHATE REGULATION

Reviewed By Date

Approved By Date

DETAIL $\frac{1}{3}$



LEGEND

SUMP RISER

WASTE WATER SYSTEMS PUMP

PLRC LEACHATE PUMP

PLRC PUMP DISCHARGE HOSE

PLRC SIGNAL SWITCHES

WASTE WATER SYSTEMS SWITCH

FORCE MAIN RETURN LINE

CLIENT WMI PIEDMONT

SUBJECT CHECK VALVE DETAIL

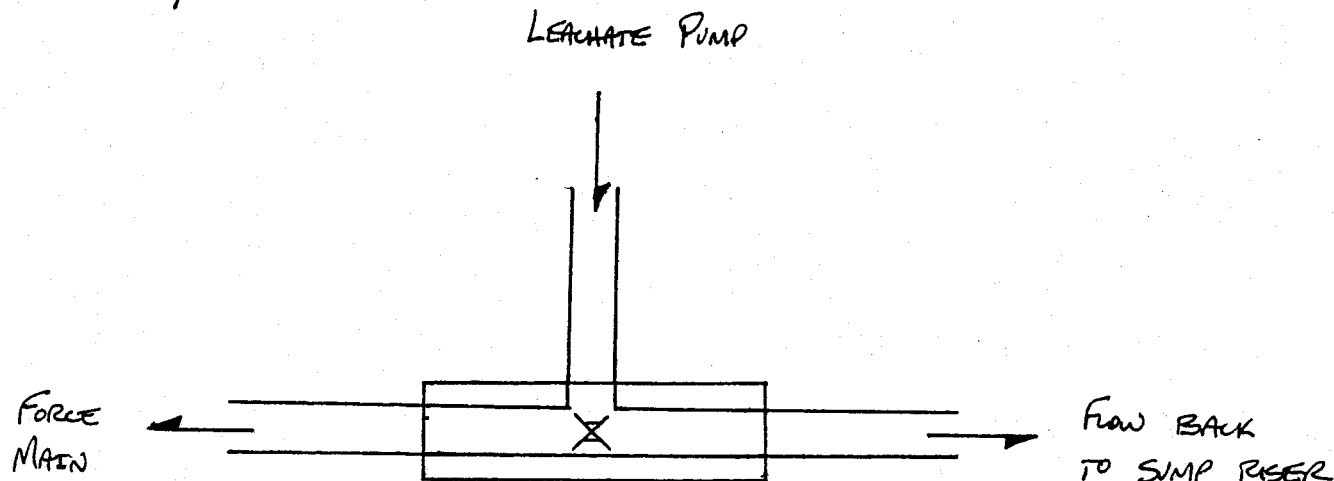
Prepared By C.E.H. Date 2-4-93

PROJECT LEACHATE RECURVATION

Reviewed By Date

Approved By Date

DETAIL 1/4



VALVE SYSTEM IS ELECTRICALLY CONTROLLED. WHEN LEACHATE RECURVATION SYSTEM NEEDS LEACHATE, THE VALVE OPENS TO ALLOW LEACHATE FROM THE FORCE MAIN TO FLOW INTO THE EXISTING SUMP. THE VALVE WILL CLOSE WHEN THE SUMP LEACHATE PUMP IS TURNED ON. THE PLRL LEACHATE PUMP IS THE CONTROLLING FACTOR FOR OPERATION OF THE VALVE.

N.T.S.

CLIENT WMI PRC

SUBJECT

Prepared By CEH Date 2-5-93

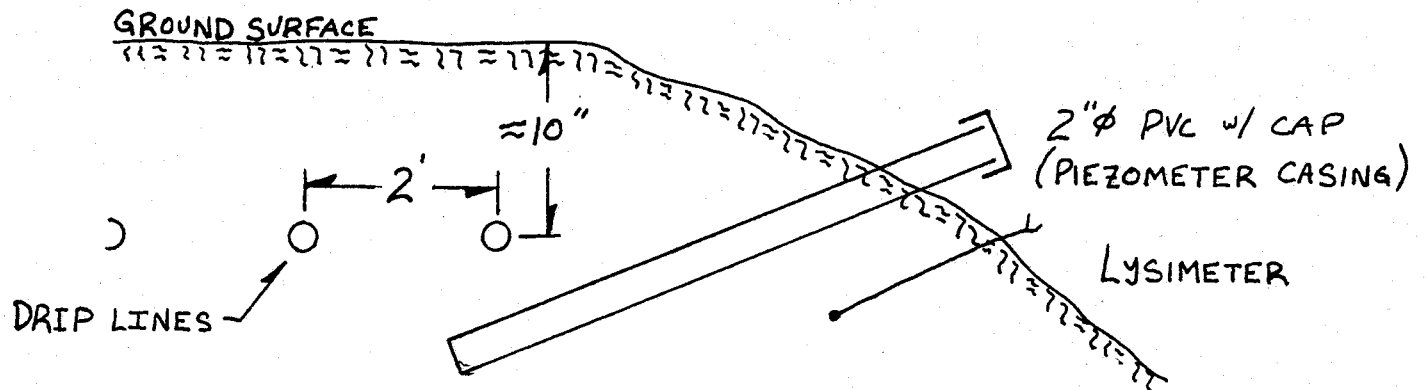
PROJECT LEACHATE RECOVERY

PIEZOMETER DETAIL

Reviewed By Date

Approved By Date

DETAIL $\frac{1}{5}$



TYPICAL PIEZOMETER AND LYSIMETER ARRANGEMENT. SET TO
AN APPROXIMATE DEPTH OF 6 ft (2 TO 3 VERTICAL FEET BELOW
DRIP FIELD).

N.T.S.

RUST ENVIRONMENT & INFRASTRUCTURE

Formerly SEC Donohue

RUST Environment & Infrastructure Inc.
15 Brendan Way • Greenville, SC 29615
P.O. Box 24000 • Greenville, SC 29616
Tel. (803) 234-3000 • FAX (803) 234-3069

October 20, 1993

Mr. William R. Lewis, P.E.
Division President
Piedmont Landfill & Recycling Center
9900 Freeman Road
Kernersville, North Carolina 27284

RE: Certification of Construction
Gas Monitoring Wells
Leachate Recirculation Project
Piedmont Landfill & Recycling Center

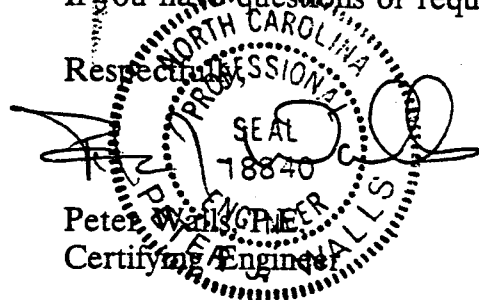
Dear Mr. Lewis:

This letter is to certify construction of the gas monitoring wells for the leachate recirculation project has been completed in substantial compliance with the August 1992 submittal to NCDEHNR and their approval letter of September 24, 1992. Work was completed December 12, 1992.

Our certification is based on inspection of the work, professional judgement and knowledge of the type facilities installed.

If you have questions or require additional information please contact our office.

Respectfully,


Peter Walls, P.E.
Certifying Engineer

cc: Mr. Edward L. Gibson, P.E., PLRC
Mr. P.J. Monaco, RUST E&I
Project No. 81857, File 3.0 & 9.0



PHOTOGRAPHIC DOCUMENTATION

1. CUTTING TRENCH
2. DRIPPER LINE AT DITCH
3. TRENCHING PAD
4. FEED AND BACKFLASH TRENCHES
5. HOOK UP OF LINES
6. PUMPS SIDE BY SIDE WITH SWITCH
7. HOOK UP CONTROLS
8. BACKFILLED PAD





